



## **Katadyn – Hiker / Hiker Pro**

[www.katadyn.com](http://www.katadyn.com)

### **Device Information**

The Katadyn Hiker is a handheld pump water treatment device containing microfilter treatment technology. Containing what the manufacturer terms “AntiClog Technology”, the device consists of 129 square inches of pleated 0.3  $\mu\text{m}$  glass fiber media, with an activated carbon core. This device creates an absolute barrier to contaminants greater than the pore size and may remove taste and odor through carbon filtration. This device contains no chemicals and requires no wait time. It is recommended that the initial liter of water be discarded due to carbon fines. During subsequent use, it is recommended that the first 5 - 10 strokes worth of water be discarded to remove stale water from the device. The device consists of a plastic housing, 130  $\mu\text{m}$  pre-filter, glass microfilter, activated carbon core, universal bottle adaptor for product water, and tubing. The pre-filter is fitted with a weight and adjustable float to keep it submerged, yet off of the bottom of the water source to limit the introduction of sediment to the filter. Additionally, pump lubricant and a carry bag are included with the device. The Katadyn Hiker Pro is an identical device with the addition of a removable filter protector, quick connect tubing fittings, and a hydration pack connector. The filter protector supplies an extra barrier to extend the microfilter life by removing particulate matter, but it is unlikely to increase microbial pathogen reduction. The quick connect fittings allow for easy removal of the tubing as well as the filling of a hydration pack without having to open the pack bladder. This device is designed for bacteria and cyst reduction. The manufacturer makes no virus reduction claims.

### **Effectiveness Against Microbial Pathogens**

Independent laboratory results were received challenging the Katadyn Hiker (tested under a previous brand name) against a modified version of the U.S. Environmental Protection Agency (USEPA) Guide Standard and Protocol for Testing Microbiological Water Purifiers (reference 1). Results for bacteria challenge showed reduction of  $> 6\text{-log}$  based on geometric averages of samples collected (references 2, 3). Data collected for *Cryptosporidium* reduction met the  $> 3\text{-log}$  reduction requirement of reference 1 (references 2, 3). Since the primary reduction mechanism is size exclusion, and because *Giardia* cysts are larger in size than *Cryptosporidium* oocysts, similar results for *Giardia* cyst reduction can be assumed. This device is not designed for virus reduction and, therefore no data was reviewed for reduction of this pathogen. Due to unclear testing conditions and modifications of testing water quality as compared to the requirements of reference 1, this device is assigned one  $\checkmark$  each for bacteria

and cyst reduction (for an explanation of the rating checks [click here](#)) based on size exclusion by the glass microfilter. Since the device is not designed, and has no mechanism for virus reduction, the device is assigned one X for this pathogen.

**Table. Expected Performance Against Microbial Pathogens.**

Microbial Pathogen Type	Expected Disinfection Capability	Evaluation Rating	Pathogen Reduction Mechanism
Bacteria	> 6-log	√	size exclusion
Viruses	not effective*	X	none
<i>Giardia</i> cysts	> 3-log	√	size exclusion
<i>Cryptosporidium</i> oocysts	> 3-log	√	size exclusion

\* Additional treatment required for virus reduction.

#### Production Rate and Capacity

Inherent to the production rate and capacity of filtration devices is the quality of the raw water source. The manufacturer stated production capacity of the device is 750 L at a rate of 1 L/min. User effort is stated to be 48 strokes/min, resulting in 1 L of product. This device utilizes a glass depth microfilter. The filter cannot be backwashed, and once clogged must be replaced. If clogged, a small amount of water may be produced if the filter is removed and swished in water (raw water acceptable). The Katadyn Hiker Pro contains a filter protector which will extend the life of the microfilter, but clogging may still occur, dependent upon the raw water quality. The filter protector is a removable coarse material that can be scraped clean and swished in water to remove particulates. The capacity of this device will vary widely with raw water turbidity.

#### Cleaning, Replacement, and End of Life Indicator

This device cannot be backwashed to remove sediment from the filter. When the device becomes unusable due to decreased production rate, the clogged filter must be replaced. The filter protector of the Hiker Pro can be removed, cleaned, and reused. The device contains no end of life indicator short of filter clogging. Since the device works solely on size exclusion, as long as the device will process water, stated pathogen reductions should be valid. The carbon core will eventually become exhausted. Since little or no pathogen reduction is attributed to the



carbon core, if it were to be exhausted prior to clogging of the microfilter, microbial quality should be unchanged. No data was presented to determine the capacity of the carbon core.

#### Weight and Size

Hiker / Hiker Pro	310 grams
Size (height x diameter)	16.5 cm x 8 cm
Tubing, 2 pieces (length, each)	92 cm

#### Cost

Hiker	\$60.00
Hiker Pro	\$70.00
Hiker and Hiker Pro replacement filter (glass microfilter, carbon, filter protector)	\$35.00

#### Device Evaluation

The Katadyn Hiker utilizes a glass microfilter and carbon core for the reduction of bacteria, and cysts, as well as taste and odor. Independent data collected under a modified USEPA protocol (reference 1) showed reduction of bacteria and cysts by > 6-log and > 3-log, respectively. Laboratory results are unclear on flow rate used during testing and the challenge water quality was not strict to reference 1. Pathogen reduction by size exclusion with a 0.3 µm microfilter is a proven mechanism and, therefore, this device is assigned one check each for bacteria and cyst reduction, indicating pathogen reduction to the requirements of reference 1 are expected (reference 4). No virus reduction is claimed by the manufacturer or expected using this device. Additional treatment is required to fully meet the requirements of reference 1 and ensure adequate reduction of all three classes of microorganism. No information was given as to any maintenance required during testing. This device, like all filters with small pore sizes, is highly affected by turbid (cloudy) waters. This device utilizes no chemicals and requires no wait time prior to water consumption. There is no indicator of process failure or end of device useful life except filter clogging or by the user keeping track of the volume of water produced. This device contains no pressure reducing valve. The user should be careful not to over pressurize the filter as the device clogs, potentially damaging the integrity of the filter element and reducing the pathogen reduction effectiveness. No manufacturing information or quality control data was received for this device. The manufacturer states ISO 9000 certification. No information was received on the storage life or required storage conditions for this device.



### Advantages

- Based on treatment technology and independent data reviewed, this device should be capable of reducing bacteria and cysts to within the requirements of the USEPA Guide Standard and Protocol for Testing Microbiological Water Purifiers (reference 1).
- No wait time prior to water consumption.
- Activated carbon core should reduce taste and odors.
- Simple and lightweight.

### Disadvantages

- Device is not designed for virus reduction and, therefore, unable to fully meet the pathogen reduction requirements of the USEPA Guide Standard and Protocol for Testing Microbiological Water Purifiers (reference 1).
- Additional treatment required.
- Small pore size of filter makes device inherently susceptible to clogging by waters with elevated turbidities.
- Device unable to be backwashed.
- No real-time indicator of process failure.

### References

1. USEPA, 1989. Guide Standard and Protocol for Testing Microbiological Water Purifiers. *Federal Register*. 54:34067.
2. Independent laboratory results of tests showing bacteria and cyst reduction, 1996. Provided by Katadyn.
3. Independent laboratory results of tests showing bacteria and cyst reduction, 1995. Provided by Katadyn.
4. U.S. Army Center for Health Promotion and Preventive Medicine, 2005. *Technical Information Paper; Filtration in the Use of Individual Water Purification Devices*, Aberdeen Proving Ground, MD.

